

-:4

FIG. 1

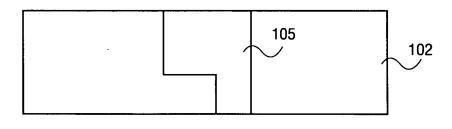


FIG. 2

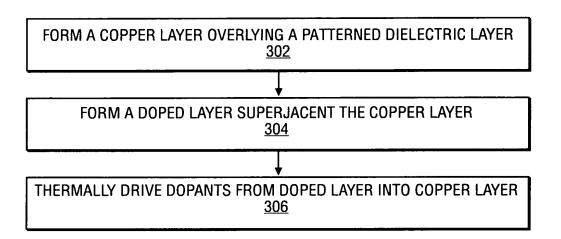


FIG. 3

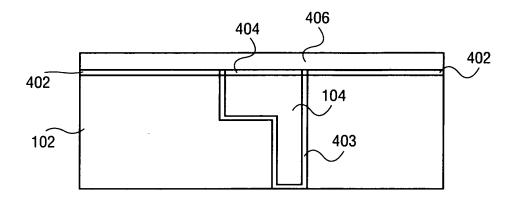


FIG. 4

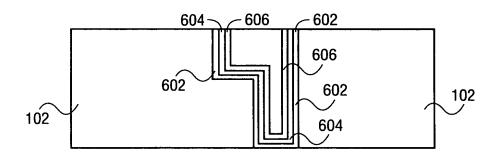


FIG. 6

FORM A COPPER LAYER OVERLYING A PATTERNED DIELECTRIC LAYER 502

REMOVE EXCESS METAL SO AS TO FORM INDIVIDUAL COPPER INTERCONNECT LINES 504

IMPLANT DOPANTS INTO AT LEAST THE INTERCONNECT LINES 506

FIG. 5

PATTERN A DIELECTRIC LAYER TO FORM AT LEAST
TRENCHES THEREIN
702

FORM A COPPER-DIFFUSION BARRIER OVER THE SURFACES OF
THE PATTERNED DIELECTRIC LAYER
704

DEPOSIT A DOPED SEED LAYER OVER THE BARRIER LAYER
706

DEPOSIT A CAPPING LAYER OVER THE DOPED SEED LAYER WITHOUT
EXPOSING THE DOPED SEED LAYER TO THE ATMOSPHERE
708

PATTERN A DIELECTRIC LAYER TO FORM AT LEAST TRENCHES THEREIN <u>802</u> FORM A COPPER DIFFUSION BARRIER OVER THE SURFACES OF THE PATTERNED DIELECTRIC LAYER 804 DEPOSIT A DOPED SEED LAYER OVER THE BARRIER LAYER <u>806</u> DEPOSIT A CAPPING LAYER OVER THE DOPED SEED LAYER WITHOUT EXPOSING THE DOPED SEED LAYER TO THE ATMOSPHERE 808 DEPOSIT A COPPER LAYER OVER THE CAPPING LAYER 810 THERMALLY DRIVE DOPANTS FROM DOPED SEED LAYER TO UPPER PORTIONS OF COPPER LAYER WHILE PROVIDING ATMOSPHERE THAT **REACTS WITH DOPANT SPECIES** 812

FIG. 8